

## DESCRIPTION OF *HATI MAREGE*, A REPLICA 19TH CENTURY MAKASSAN PERAHU

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### ABSTRACT

A description of *Hati Marege*, a replica 19th century Makassan *perahu padewakang* is presented. The hull form, construction, sail plan and materials are discussed and illustrated.

**KEYWORDS:** Makassan, *perahu padewakang*, Sulawesi, Indonesia, maritime technology, boat building.

### INTRODUCTION

*Hati Marege* (Fig. 7, Frontispiece C) is a replica 19th century *perahu padewakang* built to re-enact the Makassan voyages to North Australia as a bicentennial project. This description is a supplement to a paper presenting the research and reconstruction of 19th century Makassan *perahu* design undertaken by the author prior to the construction of *Hati Marege* (Burningham 1987).

The *Hati Marege* project was instigated and realised by Peter Spillett of the Darwin Historical Society working as an associate of the Museums and Art Galleries of the Northern Territory. The project was supervised by the Museums' Director, Dr Colin Jack-Hinton. The contract for the construction of *Hati Marege* was awarded to Rustam A.M. Rustam selected his oldest step brother Haji Jafar to be the head builder or *pung'aha*. The models, drawings, lines and relative proportions for the construction were prepared by the author.

Construction was started in July 1987 and completed in November. *Hati Marege* was sailed from Ujung Pandang (Makassar) to Gove (Lat 12°S, Long 137°E,) Arnhem Land, Coburg Peninsula and finally to Darwin. The voyage took place during December 1987 and January 1988. The master was Mappagau' from Tanah Beru. The crew comprised seven *konjo* men from Tanah Beru and three Makassar men from Galesong.

*Hati Marege* is now held by the NT Museum of Arts and Sciences, Darwin, and has been accessioned into the Southeast Asian art and material culture collections.

This paper presents a description of *Hati Marege's* hull form, construction and sail plan with lines, and drawings. Lines were taken off by the author in March 1988.

The design of the traditional 19th century Makassan *perahu* was researched from material including contemporary written descriptions, sketches, models and rare photographs. Inference from 20th century South Sulawesi boat-building practice and consultation with living South Sulawesi boat builders also contributed to the reconstruction of the 19th century design (Burningham 1987).

It is not the practice of South Sulawesi boat builders to build from plans. Their shell construction technique does not readily allow a vessel to be built so that it strictly conforms to a designed set of lines because there are no frames to indicate the hull form during the construction of the plank shell.

For this reason *Hati Marege's* proposed design was presented to the boat builders as a number of drawings (reproduced in Burningham 1987), a set of relative proportions, a planked model and in verbal communication.

The reconstruction was discussed by these means with Rustam A.M., the contractor chosen to build the full size replica. It was made clear that the intention was not to impose an exact design but to broadly convey a design type and in particular to make clear the differences from 20th century traditional design. It was the responsibility of the contractor, Rustam, to convey the design to the man he chose as head builder (his oldest step brother Haji Jafar), to oversee construction

and to find timbers suitably shaped to build such a vessel.

Agreement was reached that the vessel should be 13.5m in internal length. It is the convention in South Sulawesi that the agreed length is a minimum length that can be exceeded. Often the length of the keel is agreed but the hull length is not fixed because

it depends largely on the rake and shape of the stem and stern post. Rustam agreed that the beam and depth should be in proportion to the length, resulting in a beam of approximately 4.25m to 4.5m and a depth (measured to the height of the highest straik which reaches the stem and stern post) of approximately 1.6m.

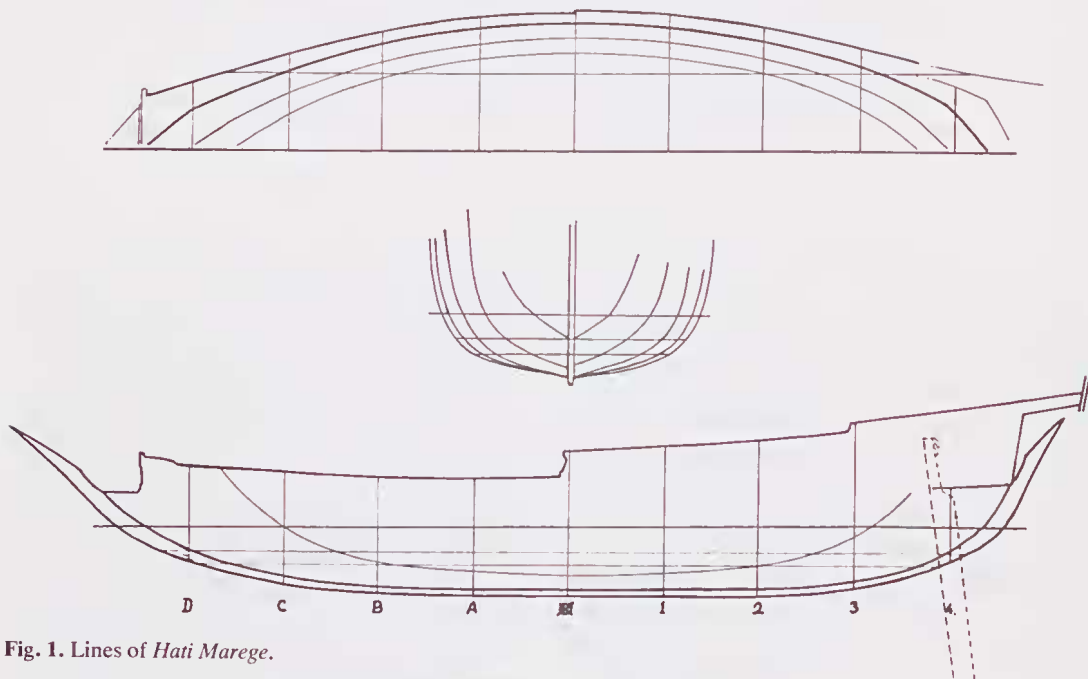


Fig. 1. Lines of Hati Marege.

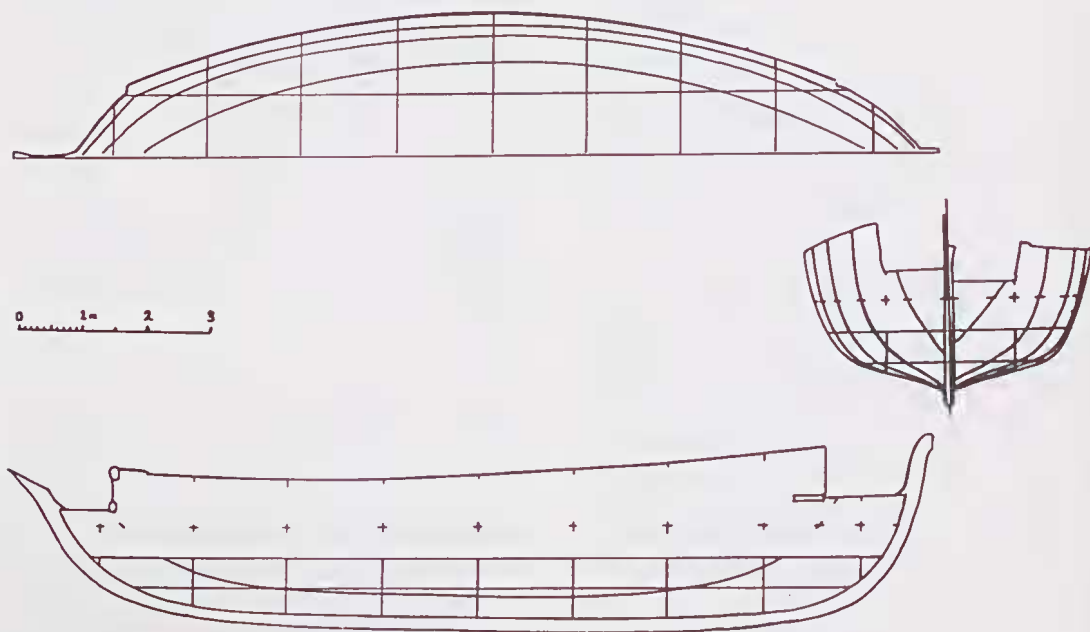


Fig. 2. Proposed lines for a perahu padewakang.

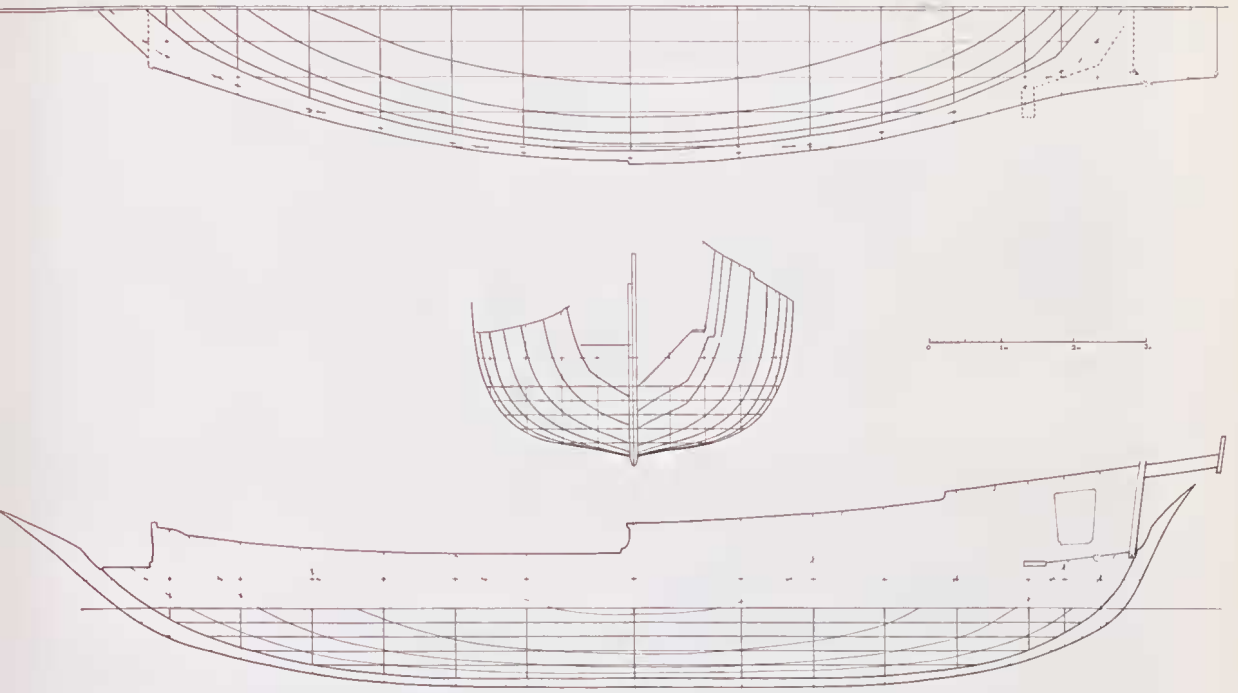


Fig. 3. Lines of *Hati Marege* showing detail of aft hull form.

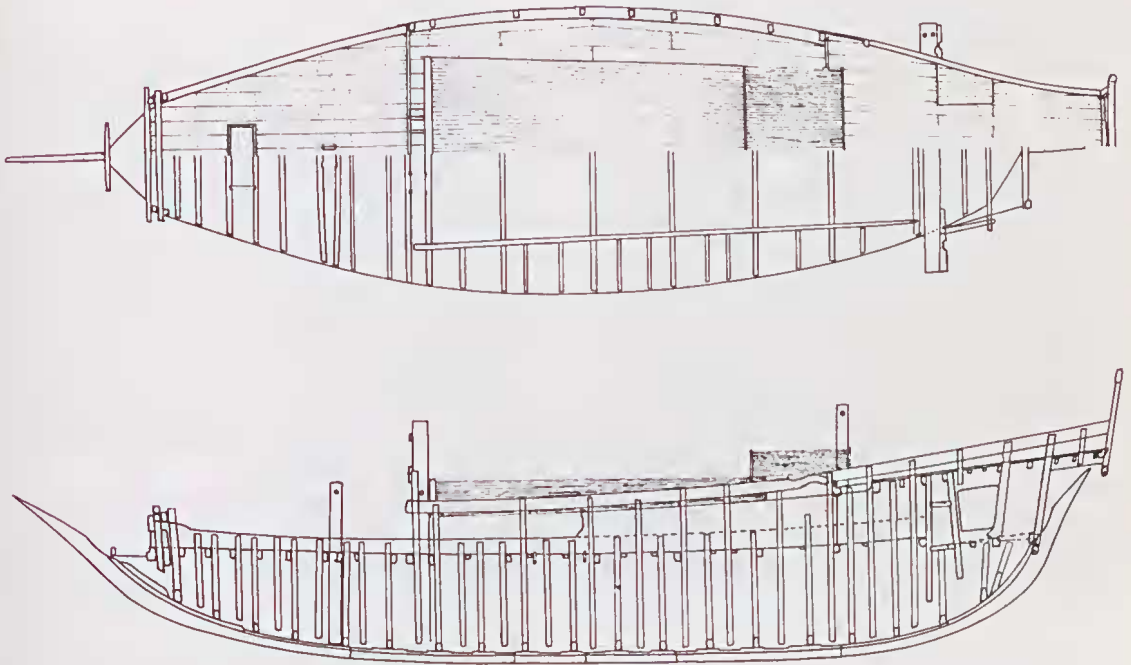


Fig. 4. Construction plan of *Hati Marege* showing keel structures frames, deck beams and deck planking.

The lines for a *perahu padewakang* of the dimensions 13.5m × 4.25m × 1.6m are shown here as Figure 1. The lines of *Hati Marege* are shown with sections at the same interval (Fig. 2).

The dimensions of *Hati Marege* are 14.25m × 4.5m × 1.3m. By comparison she is longer but with a very similar length to beam ratio. The depth is less. Figures 1 and 2 show very similar hull forms apart from the sheer. *Hati Marege* has a rather low waist and a considerable break in the sheer midships. There are differences in hull form in the entry, the midship section and in the run.

### THE ENTRY

*Hati Marege* has more cut-away in her forefoot and a more raked stem. At station C the two sets of lines are very similar but *Hati Marege* has a longer, finer entry forward of station C. The stem joins the keel 210mm forward of C. Rustam said that it was originally intended to cut the stem shorter to give the designed length of 13.5m. However Haji Jafar decided to leave the stem long and this resulted in the long entry. To conform with the design in Figure 1 a stem with a more acute curve was required, but such stems are very difficult to find because of the modern taste for long raking stems (Rustam, pers. comm.). There has been a gradual change in design towards more raked stems which is still continuing (Horridge 1981: 67; Burningham 1987: 106).

### MIDSHIP SECTION

The sections are similar. *Hati Marege* has slightly less deadrise, less hollow in the deadrise and a slightly harder turn to the bilge. She has a beamy and shallow section.

The first set of lines shown to Rustam incorporated a midsection more like *Hati Marege* (Burningham 1987: Fig. 17). Boat builders at Galesong commented that it was too shallow for a sea going trading vessel — it needed more deadrise. Rustam said it would be better with hollow in the deadrise. It seems that neither of these ideas were used by Haji Jafar. *Hati Marege* is in fact very shallow draughted. She was able to sail without ballast on a draught of approximately 0.8m.

### THE RUN

The lines aft are very full. The form can be assessed from a second set of lines with more

sections drawn (Fig. 3). The half stern angle on the 1 meter level line is 50° and the futtock lines meet this level at 33°.

There is a hard angle where the planking turns in to meet the stern post rabbett. This is a characteristic feature of both bow and stern of traditional South Sulawesi *perahu*. In *Hati Marege* it is very pronounced in the stern. The profiles of the stern post and rabbett on the sheer plan rise fairly abruptly from a point just aft of station 3 where the stern post joins the keel. There is therefore very little heel. To compensate for this the rudders are long to give sufficient lateral resistance aft. Rustam said that *Hati Marege* was given rudders 4.5m long, their length being equal to the beam, and this was according to a traditional formula. He went on to say that most vessels do not need or have such long rudders.

### CONSTRUCTION

*Hati Marege* was built entirely without metal fastenings. This was done to make her as traditional as possible although nails were not unknown in 19th century *perahu* building. For example, Wallace remarked:

"As soon as we began getting my prau ready I was obliged to give up collecting . . . I had a Kc workman to put in new ribs, for which I bought nails off a Bugis trader, at 8d a pound."

(Wallace 1869: 285)

South Sulawesi *perahu* are now usually fastened with a large number of wooden dowels or "treenails" supplemented by a small number of mild steel bolts. Very large *perahu* have a greater proportion of bolts used in their fastening. Sometimes square sectioned "boat nails" are used but they are regarded as inferior to treenails in terms of strength (Haji Syukri and Syaharir, South Sulawesi pers. comm. 1984<sup>1</sup>). Where no bolts are used to fasten the planking a number of keel bolts are normally fitted except on the smallest *perahu*. *Hati Marege* has no keel bolts nor are there treenails or any other direct fastening of the floors to the keel.

The keel is fastened to the garboard strakes by internal dowels at 200mm intervals and the garboard are fastened to the floors. The garboards are very substantial timbers. Like

<sup>1</sup>Haji Syukri and Syaharir are two of four brothers who together own probably the largest fleet of *perahu* still trading under sail.

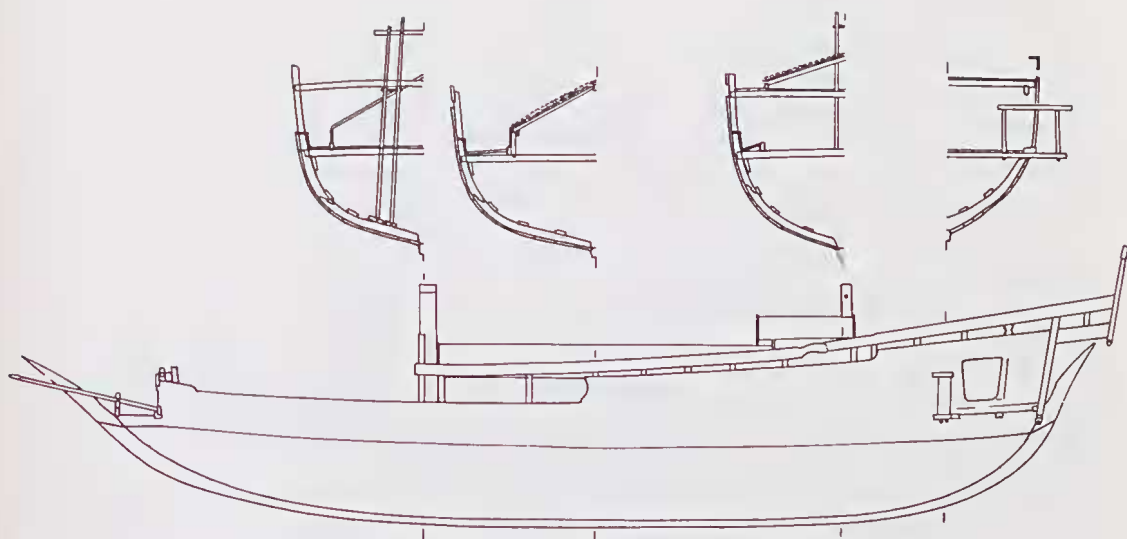


Fig. 5. Cross section of *Hati Marege* showing construction of frames, mast steps and rudder mounting.

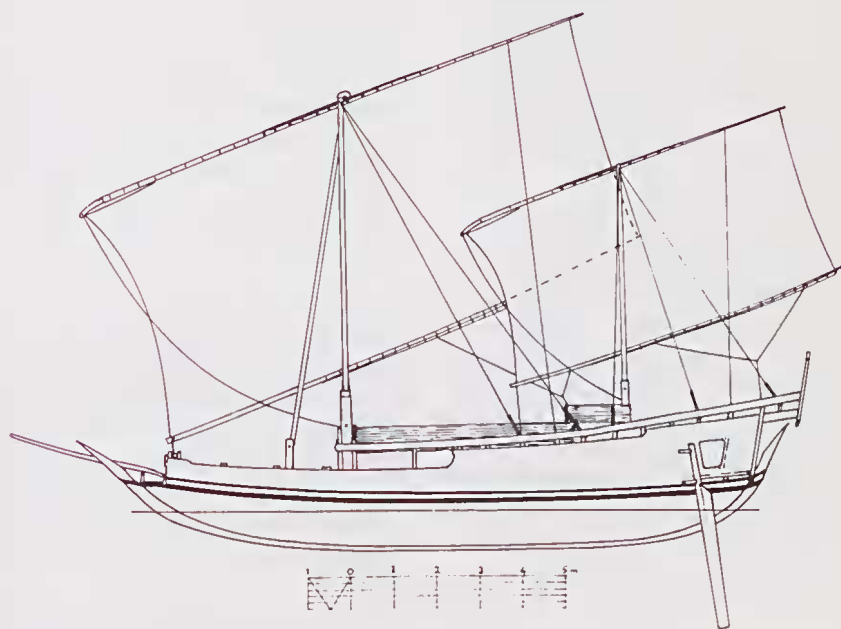


Fig. 6. Sail plan of *Hati Marege*.

the keel they are *kayu sappu* (*Eusideroxylon zwageri* — a type of iron wood) and approximately 70mm thick. The garboards are the only planks of this timber; the rest of the underwater body is *kayu bitti* (*Vitex pubescens*) while the top sides are a mix of *kayu bitti*, *kayu jati* (*Tectona grandis* — teak) and *kayu punaga* (*Callophyllum ionophyllum*). The keel itself is three lengths of *kayu sappu* while the stem and stern post are large crooked pieces of *kayu bitti*. Both stem and stern post have natural holes in the timber projecting above the rabbet. This is supposed to bring good luck (Rustam pers. comm. 1988). A Bugis manuscript recently edited by Macknight and Mukhlis (1975) describes comparable vessels and seems to deal with this question. The translation of *pa'marung* as "bowsprit" should, however, be amended to "stempost". The relevant section would then read, "If there is a knot in the forward stempost..., it is all right... If the stempost has a hole straight through (it) as it extends upwards, it is all right".

The frames are *kayu bitti* and *kayu jati* and they are large timbers. The floors range in size from 150mm to 205mm moulding and 100mm to 120mm siding. The frames are mostly 350mm between centres. There are exceptions because the position of frames is determined by the alternately raised and lowered sections on the top of the keel (Fig. 4) called *tembuku* and *ruang* (see Horridge 1979:13 and Burningham 1987: 114). In *Hati Marege* the *tembuku* and *ruang* are 350mm in length except the raised *tembuku* at each end of the keel (these are 515mm forward, and 500mm aft), and the lowered *ruang* in the middle of the keel through which the vessels *pocci*' (navel) is bored, this is 370mm long. The floors sit on the *tembuku* and the first futtocks of the alternating half frames terminate at the garboard and align with the *ruang*.

The stringers are also substantial (approx 150mm x 50mm). They are coconut palm timber. It is questionable whether 19th century *perahu* had such structurally significant stringers. Haji Syukri (pers. comm. 1979) regarded the use of stringers to strengthen the hull as a new idea. Previously stringers had been lighter and poorly fastened because they served only to keep the cargo off the planking. The sheer stringers were normally stronger because they serve to support the deck beams. Some old *perahu lambo* have no

stringers other than the sheer stringers (pers. obs.).

There is a planked foredeck and side decks around the cabin. Aft there is a high planked quarter deck or poop. Forward there is one small hatch and aft there are hatches for the helmsmen to see out if they are steering from inside the enclosed *ambeng* stern gallery. Cargo would be loaded through the cabin which has an easily removed bamboo slat floor. The same arrangement is normal on modern *perahu lambo*. Probably *Hati Marege* has a greater area of planked deck and a smaller area covered over by the thatched cabin than was commonly the case on 19th century *perahu* collecting *perahu* which seem to have had only bamboo slat decks. For example Searey (1907: 24) described such a vessel:

"The hull is of wood, and the . . . deck roof and yards are made of bamboo . . . The deck is of split bamboo, worked together with wire or fibre, and can be rolled up at pleasure".

Above the deck level the gunwales are planked inside and outside the projecting top futtocks and there is a plank capping rail. This arrangement would have been considered innovative on a *perahu* ten years ago and is a new western introduction (pers. obs.). Possibly the deck layout design recognises that *Hati Marege* was destined for a more prestigious role, and that she would need relatively uncluttered planked decks which would not be too awkward for visiting dignitaries, who could hardly be expected to scramble over the thatched cabin roof.

## THE RIG AND SAIL PLAN

Rustam felt that the mainsail was too small. Before building *Hati Marege* he was concerned that a properly proportioned mainsail (with booms slightly longer than the hull) would be very difficult to handle and that no-one living had experience of handling such a sail. Presumably it was Rustam's decision to make an undersized sail but he said it was a pity that *Hati Marege's* looks were spoiled by the sail and by the break in the sheer mid-ships. According to members of the crew performance was not badly affected but she would not easily turn to windward without the mizzen set. This seems to indicate some lee helm.



Fig. 7. *Hati Marege* under sail. Photo: Dr Colin Jack-Hinton.

There is no wire rigging. The several running stays which support the masts are rotan with coir lanyards. The rotan is of fairly small diameter. In the past much larger rotan has been used for anchor lines (pers. obs.) and probably for running stays.

The halliards are hemp, although coir might have been more appropriate. Some lacing, bolt ropes and lanyards are rope made from the black fibres of the *ijok* palm (*Arenga pinnata*).

#### DISCUSSION

*Hati Marege* is soundly constructed and she is probably an accurate reconstruction of the appearance of a 19th century Makassan *perahu*. She is very shallow draughted but, no doubt, some *perahu* were shallow draughted while others were deep draughted in the 19th century, with as much range of design as exists now.

It could be that her builders showed a tendency to retain 20th century design features

with which they are familiar. In particular *Hati Marege* has the high stern of a 19th century vessel, but the lowest point of the sheer is near midships rather than forward. This was achieved by building a rather severe break in the sheer midships and by a higher bow than was normal in the 19th century.

#### REFERENCES

- Burningham, N. 1987. Reconstruction of a 19th century Makassan *Perahu*. *The Beagle, Records of the Northern Territory Museum of Arts and Sciences* 4(1): 103-128.
- Horrige, G.A. 1979. *The Konjo boat builders and the Bugis prahus of South Sulawesi*. Maritime Monographs and Reports No. 40. National Maritime Museum: Greenwich.
- MacKnight, C.C. and Mukhlis 1975. A Manuscript about Bugis Praus. *Archipel* 10:271-282.
- Searcy, A. 1907. *In Australian tropics*. Kegan Paul, Trench, Trubner & Co Ltd: London.
- Wallace, A.R. 1869. *The Malay Archipelago*. Macmillan: London. (Reprinted 1962, Dover: New York).

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